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ABSTRACT

This document contains materials for an advanced college course in cardiac life support developed for the State of Iowa. The course syllabus lists the course title, hours, number, description, prerequisites, learning activities, instructional units, required text, six references, evaluation criteria, course objectives by units, course competencies, equipment and supply requirements, class schedule, testing requirements for performance tests, and American Heart Association course guidelines for certification for advanced providers of cardiac life support. It is followed by 12 instructional units that cover these topics: introduction; myocardial infarction; adjuncts for airway control, ventilation, and supplemental oxygen; adjuncts for artificial circulation; monitoring and dysrhythmia recognition; defibrillation and cardioversion; intravenous techniques; cardiovascular pharmacology; mega code/advanced cardiac life support algorithms; pediatric resuscitation; acid-base balance; and medicolegal aspects. Units contain the following: information on prerequisites, required and recommended references, learning activities, and objectives; a topic outline; and evaluation criteria. (KC)

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ADVANCED CARDIAC LIFE SUPPORT

Developed by: Health Science Department
Kirkwood Community College
For the State of Iowa
Department of Education
Bureau of Career Education

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COURSE: ACLS page 1 of 10

HOURS: 48 hours (16 lecture hrs., 32 lab hours)

COURSE NUMBER: HS435U

COURSE

DESCRIPTION: Provides theory and laboratory practice in managing specific life threatening cardiac dysrhythmias resulting from myocardial infarction. Includes review of basic life support; use of mechanical aids to establish an airway and maintain ventilation; EKG monitoring and recognition of life threatening dysrhythmias, cardiac defibrillation; establishing an intravenous drug access and initiating appropriate cardiac drug therapy.

PREREQUISITES: HS100U CPR/First Aid (can be taken concurrently) or current American Heart Association certification for FIRST RESPONDERS MODULE C

LEARNING

ACTIVITIES:

1. lectures and demonstrations
2. slide and videocassette presentations
3. reading assignments
4. laboratory exercises

INSTRUCTIONAL

UNITS:

1. Introduction
2. Myocardial Infarction
3. Adjuncts For Airway Control, Ventilation, and Supplemental Oxygen
4. Adjuncts For Artificial Circulation
5. Monitoring And Dysrhythmia Recognition
6. Defibrillation And Cardiversion
7. Intravenous Techniques
8. Cardiovascular Pharmacology
9. Mega Code/ACLS Algorithms
10. Pediatric Resuscitation
11. Acid-Base Balance
12. Medicolegal Aspects

REQUIRED TEXT:

1. Textbook of Advanced Cardiac Life Support, 48 authors, American Heart Association, 1987
2. 'Standards And Guidelines For Cardiopulmonary Resuscitation And Emergency Cardiac Care', 20 consultants and contributors, American Heart Association, reprinted from The Journal of the American Medical Association, June

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REQUIRED TEXT: continued

6, 1986, Volume 225, Number 21

REFERENCES:

- KHO 342 Arrhythmias Originating from the Sinus Node
KHO 343 Arrhythmias Originating in the Atria
KHO 344 Arrhythmias Originating from the A-V Node or A-V Junction
KHO 345 Arrhythmias Originating in the Ventricles

Advanced Cardiac Life Support: Certification, Preparation, And Review, second edition, Bruce R. Shade, EMT/P; Joann Grif Alspach, RN, MSN, CCRN; Michael J. Ballenger, RN, MSN, CCRN; Victor A. Morant, MD, Prentice Hall,
Cardiac Quiz Cards, set of 80, AMEC, 1986

EVALUATION:

Certification for Advanced Cardiac Life Support requires:

1. 86% score on 50 question multiple choice examination
2. Testing Stations:
 - a. Airway Station
 - Insert oral airway, connect oxygen, turn oxygen on, connect to pocket mask and ventilate
 - Intubation of adult with ventilation
 - Insertion of esophageal airway with ventilation
 - b. Dysrhythmia Recognition and Therapy
 - Identification of cardiac rhythms with appropriate indications for treatment to include:
 - drug dosage indications, amounts and frequencies
 - defibrillation
 - pacemaker usage
 - Must be able to state indications for drips and appropriate administration of drips
 - Rhythms to be identified and treated are:
 - bradycardia
 - third-degree block
 - ventricular fibrillation
 - ventricular tachycardia
 - premature ventricular contractions
 - asystole
 - electromechanical dissociation
 - c. Basic Life Support
 - to American Heart Associations

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EVALUATION: continued

standards:

produce a strip of one-rescuer CPR
demonstrate two-resucuer CPR

d. Mega Code

- arrhythmia recognition
- knowledge of correct therapy
artificial ventilation and
circulation
defibrillation
drugs
- leadership
assessment
evaluation
supervision
problem-solving

Basic Life Support and Mega Code must be
sucessfully completed on the first attempt.
The other stations may be repeated one time
during a testing session.

successful completion of the above - Grade A

Final Exam score of 78% - 84% and/or failure
to successfully complete one of the four
Testing Stations - Grade B

Final Exam score of 70% - 76% and/or failure
to sucessfully complete two of the four
Testing Stations - Grade C

Final Exam score of 62% - 68% and/or failure
to successfully complete three of the four
Testing Stations - Grade D

Final Exam score of 60% or less and/or
failure to successfully complete all of the
Testing Stations - Grade F

COURSE

OBJECTIVES: UNIT 1 - INTRODUCTION

1. Define advanced life support
2. Define sudden cardiac death
3. List the factors that identify a high-risk
patient
4. Appreciate the importance of advanced life
support in the provision of emergency
cardiac care

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UNIT 2 - MYOCARDIAL INFARCTION

1. Define myocardial infarction (MI)
2. Recognize the symptoms of and the responses to myocardial infarction
3. Describe the five general management approaches to MI.
4. Describe the management techniques for the following abnormal heart rates and arrhythmias:
 - a. premature ventricular complexes
 - b. ventricular rhythms
 - c. bradycardias
 - d. sinus tachycardias
 - e. supraventricular arrhythmias
 - f. atroventricular junctional rhythms
 - g. ventricular tachycardia
 - h. atrioventricular block
 - i. intraventricular block
 - j. ventricular fibrillation
5. Describe normal hemodynamic patterns and the usual abnormal patterns following MI
6. Define and describe the following cardiac conditions:
 - a. congestive heart failure
 - b. acute pulmonary edema
 - c. cardiogenic shock
 - d. right ventricular infarction
 - e. acute mitral regurgitation
 - f. ventricular septal rupture
 - g. massive pulmonary embolism
 - h. hypovolemia and septic shock
 - i. cardiac tamponade
 - j. aortic dissection
7. List five special therapeutic considerations in the treatment of cardiovascular disease
8. Describe the mortality of post-MI patients, both in-hospital and post-discharge, and measures to improve that mortality

UNIT 3 - ADJUNCTS FOR AIRWAY CONTROL,
VENTILATION, AND SUPPLEMENTAL OXYGEN

as detailed in AHA/ACLS objectives and skills for Teaching Stations:

#1: Adjuncts for Airway and Mechanical Breathing

#2: Esophageal and Endotracheal Intubation

UNIT 4 - ADJUNCTS FOR ARTIFICIAL CIRCULATION

1. Describe the indications for and physiologic effects of the following:

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UNIT 4 - ADJUNCTS FOR ARTIFICIAL CIRCULATION

continued

- a. manual and automatic chest compressors
 - b. pneumatic antishock garments
 - c. direct cardiac massage
 - d. emergency cardiopulmonary bypass
 - e. intraaortic balloon counterpulsation.
2. Perform One-Rescuer CPR: Adult to AHA performance standards.
 3. Demonstrate Two-Rescuer CPR: Adult using AHA performance standards.

UNIT 5 - MONITORING AND DYSRHYTHMIA RECOGNITION

1. Describe the functional anatomy and electrophysiological activities of the heart.
2. Describe the components necessary to identify arrhythmias.
3. Define, describe, and be able to recognize the following rhythms and arrhythmias:
 - a. normal sinus rhythm
 - b. sinus tachycardia
 - c. sinus bradycardia
 - d. premature atrial contractions
 - e. atrial tachycardia
 - f. atrial flutter
 - g. atrial fibrillation
 - h. premature junctional complexes
 - i. junctional escape complexes and rhythms
 - j. premature ventricular complex
 - k. ventricular tachycardia including torsade de pointes
 - l. ventricular fibrillation
 - m. ventricular asystole (cardiac standstill)
 - n. atrioventricular blocks including:
 - first-degree AV block
 - type 1 second-degree AV block (Wenckebach)
 - type 2 second-degree AV block
 - third-degree AV block
 - o. supraventricular and ventricular complexes and rhythms
4. Describe presentation and etiologies of and therapies for non-life threatening arrhythmias

UNIT 6 - DEFIBRILLATION AND CARDIOVERSION

1. Describe the components of a DC defibrillator.
2. Define the concepts of energy, current, and

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UNIT 6 - DEFIBRILLATION AND CARDIOVERSION

continued

voltage as they pertain to defibrillation and cardioversion.

3. Describe the physiologic effects of defibrillation.
4. Define the energy requirements for adult and pediatric defibrillation.
5. Describe and be able to perform the procedure asynchronous defibrillation and urgent synchronized cardioversion.
6. Describe the special considerations in resuscitating a patient with an automatic implantable cardioverter defibrillator or a permanent pacemaker.
7. Describe three approaches to external cardiac pacing and the indications for each approach.
8. Describe the indications and procedure for a precordial thump.

UNIT 7 - INTRAVENOUS TECHNIQUES

1. Name three indications for intravenous (IV) cannulation.
2. Name three types of intravenous cannulas.
3. Describe indications and techniques for each of the three IV cannulas.
4. Describe principles and complications common to all IV techniques.
5. Describe the anatomy and insertion techniques for peripheral veins.
6. Describe advantages and disadvantages in the use of peripheral veins for IV cannulation.
7. Be able to perform IV cannulation on the peripheral veins of the upper extremities.
8. Describe the anatomy, insertion techniques, advantages, disadvantages, and specific complications in the IV cannulation of the following:
 - a. femoral vein
 - b. internal jugular vein
 - c. subclavian vein

UNIT 8 - CARDIOVASCULAR PHARMACOLOGY

1. Describe - mechanisms of actions
 - indications
 - dosage and administrationand - precautions for the following drugs:
 - a. oxygen

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UNIT 8 - CARDIOVASCULAR PHARMACOLOGY continued

- b. epinephrine
- c. atropine
- d. lidocaine
- e. procainimide
- f. bretylium
- g. verapamil
- h. sodium bicarbonate (NaHCO_3)
- i. morphine
- j. calcium chloride
- k. norepinephrine
- l. dopamine
- m. dobutamine
- n. isoproterenol
- o. amrinone
- p. digitalis
- q. sodium nitroprusside
- r. nitroglycerin
- s. propranolol
- t. metoprolol
- u. furosemide

UNIT 9 - MEGA CODE/ACLS ALGORITHMS

1. Describe the indications for and components of the following ACLS algorithms:
 - a. ventricular fibrillation*
 - b. sustained ventricular tachycardia
 - c. asystole (cardiac standstill)
 - d. electromechanical dissociation
 - e. paroxysmal supraventricular tachycardia
 - f. bradycardia
 - g. ventricular ectopy: acute suppressive therapy

*with emphasis on ventricular fibrillation.

2. perform to specified criteria the components of the Mega Code For Testing The Advanced Cardiac Life Support Team Leader

UNIT 10 - PEDIATRIC RESUSCITATION

1. Define respiratory failure and shock in the context of pediatric resuscitation.
2. Describe the components in the assessment of:
 - a. respiratory performance
 - b. cardiovascular performance.
3. Describe a method for rapid cardiopulmonary assessment.
4. Describe management methods for the following:
 - a. airway and breathing support
 - b. circulation support

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UNIT 10 - PEDIATRIC RESUSCITATION continued

c. pharmacologic support.

5. Describe the presentation of and indications for treatment of the following arrhythmias in pediatric age patients:
 - a. supraventricular tachycardia
 - b. ventricular tachycardia
 - c. bradycardias
 - d. ventricular fibrillation
 - e. electromechanical dissociation (EMD).
6. Review defibrillation indications and techniques for pediatric patients.
7. Describe the indications and dosage for the pediatric usages of lidocaine and bretylium for the management of ventricular arrhythmias.

UNIT 11 - ACID-BASE BALANCE

1. Define acid and base as they relate to body pH.
2. Describe the respiratory and metabolic constituents that alter pH and how it is altered.
3. Describe the body's buffer systems.
4. Describe a method for clinical blood gas analysis.
5. Describe the acid-base changes that occur during CPR.
6. Describe the indications for the use of pharmacological buffers during CPR.

UNIT 12 - MEDICOLEGAL ASPECTS

1. Describe five general concepts of medical-legal liability.
2. Describe the decision-making processes for whether or not to initiate CPR.
3. Describe the decision-making processes for terminating CPR.
4. Define the concept, indications, and legality of Do Not Resuscitate orders.
5. Describe the decision-making processes for terminating life support systems.

COURSE

- COMPETENCIES:
1. American Heart Association/Advanced Cardiac Life Support (AHA/ACLS) Teaching Station #1: Adjuncts for Airway and Mechanical Breathing
 - a. Nasal and Oropharyngeal Suctioning
 - b. Insertion of Oropharyngeal Airway

COURSE: ACLS

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COURSE

- COMPETENCIES: AHA/ACLS Teaching Station #1: continued
- c. Insertion of Nasopharyngeal Airway
 - d. Supplemental Oxygen Devices for Spontaneously Breathing Patient
 - e. Mouth-to-Mouth Ventilation with Supplemental Oxygen
 - f. Bag-Valve-Mask Unit Ventilation
 - g. Manually-Triggered, Oxygen-Powered, Breathing Device Ventilation
2. AHA/ACLS Teaching Station #2: Esophageal and Endotracheal Intubation
- a. Esophageal Airway
 - b. Adult Intubation
 - c. Intubation of trachea with Esophageal Airway in Place
 - d. Infant Intubation
3. AHA/ACLS Teaching Station #3: Intravenous and Intravenous Techniques
- Verbalize and demonstrate landmarks and technique
- a. Peripheral Veins (Adult and Pediatric)
 - Arm, Leg, or Scalp Vein
 - External Jugular Vein
 - b. Central Veins
 - Femoral: Adult and Pediatric
 - Subclavian, Infraclavicular Approach
 - Internal Jugular: Central Route
4. AHA/ACLS Teaching Station #4: Defibrillation and Cardioversion
- a. Defibrillation
 - Monitored Ventricular Fibrillation
 - Unmonitored Ventricular Fibrillation
 - b. Emergency Cardioversion
 - Ventricular Tachycardia (Stable)
 - Ventricular Tachycardia Unstable - i.e., Chest Pain, Dyspnea, Hypotension, CHF, Ischemia or Infarction)
 - Countershock of Ventricular Tachycardia Without Pulse
 - Unstable Supraventricular Tachycardia
5. AHA/ACLS Teaching Station #5: Recognition Of Dysrhythmias, Static and Dynamic
- a. static alone
 - PAC, PJC
 - SVT
 - Junctional rhythm

COURSE:

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5. AHA/ACLS Teaching Station #5: continued

- AV Blocks
- b. static and dynamic
 - Sinus Rhythms
 - Atrial Flutter and Fib
 - PVC (Unifocal and Multifocal)
 - V Tach (Paroxysmal and Sustained)
 - V Fib
 - Asystole
 - Artifact

6. AHA/ACLS Teaching Station #6: Recognition
Of Dysrhythmias And Therapeutic
Modalities

ACLS Algorithms

- V Fib
- Asystole
- Third-Degree Heart Block
- V Tach (Paroxysmal and Sustained, with
Pulse (Conscious and Unconscious) and
without Pulse
- PVC (Unifocal and Others)
- EMD
- Bradycardia (Sinus, Junctional, or
Second-Degree AV Block) with hypotension

7. AHA/ACLS Teaching Station #7: Mega Code

- a. Team Leader
 - Supervision and Leadership
 - Proper Sequencing
 - Monitoring Other Team Members
 - Rhythm Diagnosis
 - Defibrillator Operation
 - Drugs
 - Ordering and Interpretation of Lab Data
- b. Team Member
 - Ability to Work as Team Member
 - Assist Team Leader Effectively
 - Airway Management
 - BLS -- CPR
 - IV Management and Recordkeeping

ACLS - EQUIPMENT and SUPPLY REQUIREMENTS

Teaching Station #1 - Adjuncts for Airway and Mechanical Breathing

1. suction catheters
2. rigid pharyngeal suction devices (Yankauers)
3. nasal cannula
4. simple oxygen mask
5. venturi mask (HAFOE)
6. oropharyngeal airways
7. nasopharyngeal airways
8. oxygen or air flowmeter
9. oxygen or compressed air source
10. mouth-mask resuscitators (pocket-masks)
11. recording resuscitation manikin
12. bag-valve-mask (self-inflating resuscitator)
13. manually operated, O2 powered breathing device (demand valve)
14. resuscitation masks

Teaching Station #2 - Esophageal and Endotracheal Intubation

1. esophageal obturator airway
2. esophageal gastric tube airway
3. endotracheal tubes
4. intubation manikins
 - a. adult
 - b. pediatric
5. syringes, 10 ml
6. Magill forceps
7. laryngoscopes - handles, blades
8. stethoscopes
9. intubation stylettes

Teaching Station #3 - Intravenous and Invasive Techniques

1. IV cannulas
 - a. cannula over needle
 - b. cannula through needle
2. IV tubing
3. IV solution bags
4. adult IV training arm or arm and hand
5. pediatric IV training head or arm

Teaching Station #4 - Defibrillation and Cardioversion

1. defibrillator with synchronized cardioversion
2. defibrillator pads

Teaching Station #5 - Recognition of Dysrhythmias, Static and Dynamic

1. electronic arrhythmia simulator

The remaining teaching stations and the testing stations use previously listed equipment and supplies.

COURSE: ACLS

CLASS SCHEDULE

Week 1

- Unit 1 - Introduction
- Unit 2 - Myocardial Infarction

LAB: none

Week 2

- Unit 3 - Adjuncts for Airway Control, Ventilation, and Supplemental Oxygen

LAB: Teaching Station #1 - Adjuncts for Airway and Mechanical Breathing
Teaching Station #2 - Esophageal and Endotracheal Intubation (sections A-C only)

Week 3

- Unit 4 - Adjuncts for Artificial Circulation

LAB: continue Teaching Stations #'s 1 & 2
BLS/CPR practice (adult maneuvers)

Week 4

- Cardiac Anatomy and Physiology
- Unit 5 - Monitoring and Dysrhythmia Recognition

LAB: Teaching Station #5 - Recognition of Dysrhythmias, Static and Dynamic

Week 5

Follow-Up and Review, (Examination)

LAB: continue Teaching Station #5
review all previous Teaching Stations

Week 6

- Unit 6 - Defibrillation and Cardioversion

LAB: Teaching Station #4 - Defibrillation and Cardioversion

COURSE: ACLS

CLASS SCHEDULE continued

Week 7

Unit 7 - Intravenous Techniques

LAB: Teaching Station #3 - Intravenous and Invasive
Techniques

Week 8

Unit 8 - Cardiovascular Pharmacology

LAB: none

Week 9

(Examination)

Unit 9 - Mega Code/ACLS Algorithms (Algorithms only)

LAB: Teaching Station #6 - Recognition of Dysrhythmias and
Therapeutic Modalities

Week 10

Unit 9 - Mega Code/ACLS Algorithms (Mega Code
demonstration)

LAB: Teaching Station #7 - Mega Code

Week 11

Unit 10 - Pediatric Resuscitation

LAB: Teaching Station #2 - Esophageal and Endotracheal
Intubation (section D)
BLS/CPR (child and infant maneuvers)

Week 12

Unit 11 - Acid-Base Balance

LAB: review and practice previous Teaching Stations

COURSE: ACLS

CLASS SCHEDULE continued

Week 13

Unit 12 - Medicolegal Aspects

LAB: review and practice previous Teaching Stations

Weeks 14, 15, 16

AHA/ACLS Written Examination

AHA/ACLS Testing Stations: Airway
Rhythm and Drugs
Basic Life Support
Mega Code

COURSE: ACLS

TESTING REQUIREMENTS FOR ACLS

A. AIRWAY STATION:

1. -insert oral airway
-connect oxygen source
-turn oxygen source on
-connect oxygen to pocket mask
-ventilate
2. -oral intubation
-ventilate
3. -insert esophageal airway
-ventilate

B. RHYTHM and DRUGS

1. Identification of cardiac rhythms with appropriate indications for treatment to include:
 - drug dosage indications
 - amounts and frequency
 - defibrillation
 - pacemaker usage
2. Must be able to state:
 - indications for drips
 - appropriate administration of drips
3. Rhythms to be identified and treated are:
 - bradycardia
 - third-degree block
 - ventricular fibrillation
 - ventricular tachycardia
 - premature ventricular contractions
 - asystole
 - electromechanical dissociation

C. BASIC LIFE SUPPORT (BLS):

1. by American Heart Association standards:
 - produce a strip for One-Rescuer CPR: Adult
 - demonstrate Two-Rescuer CPR: Adult

D. MEGA CODE

See detailed criteria in MEGA CODE FOR TESTING THE
ADVANCED CARDIAC LIFE SUPPORT TEAM LEADER.

BLS and Mega Code must be successfully completed on the first attempt. The other stations may be repeated one (1) time during a testing session. Failure to complete stations successfully during this testing session requires you complete a full provider course.

Other performance tasks are detailed in the skills sections of the individual Testing Stations.

DRIPS USED IN ACLS ALGORITHMS

Drugs used in ACLS algorithms may be mixed by the ACLS participants in any appropriate manner that will yield the desired rate of administration. The participant should be able to:

- a. give the amount of drug to be mixed
- b. give the fluid to which the drug will be added, including the amount
- c. Give the yield per ml/cc of the mixture
- d. give the rate of administration

Some examples of drip mixtures follow:

Lidocaine

- 1 gm in 250 D5W yields 4 mg/cc
- 3 gm in 500 D5W yields 6 mg/cc

Procainimide and Bretylium may be mixed in the same manner as Lidocaine for use as a maintenance infusion.

Isuprel/isoproterenol

- 1 mg in 250 D5W yields 4 mcg/cc

EMERGENCY CARDIAC CARE (ECC) PROGRAM
ADVANCED CARDIAC LIFE SUPPORT
TRAINING NETWORK
NOVEMBER 1, 1981

The objective of Advanced Cardiac Life Support (ACLS) is to provide an effective method of testing the practitioner's clinical knowledge and practical skill utilization in the care of the victim of a cardiac emergency.

Advanced life support consists of the following elements:

1. Basic Life Support.
2. Use of adjunctive equipment for ventilation and circulation.
3. Cardiac monitoring for dysrhythmia recognition and control.
4. Defibrillation.
5. Establishing and maintaining an IV lifeline.
6. Employing definitive therapy, including drug administration.
7. Stabilization and transportation.

The advanced training network proceeds from the national faculty to state affiliate faculty to instructor to provider of Advanced Cardiac Life Support.

Level of Certification

ADVANCED PROVIDER

Level 2

Definition:

A provider of Advanced Cardiac Life Support who has attended and successfully completed and ACLS provider course.

Certification Contingent on:

1. National cognitive exam — minimum score 86%.
2. National performance examination of the following skills:
 - a. Basic cardiac life support.
 - b. Adjuncts for airway and mechanical breathing.
 - c. Esophageal intubation of adult.
 - d. Placement of peripheral and central IV lifeline.
 - e. Recognition of ventricular fibrillation and defibrillation.
 - f. Recognition of dysrhythmias (dynamic and static).
 - g. Therapy for dysrhythmias.
 - h. Supervision and direction of arrest team in sequence of successful resuscitation.

(Advanced Provider continued)

Responsibilities:

The delivery of Advanced Cardiac Life Support.

Length of Course:

16 hours.

Recertification Contingent On:

1. National cognitive exam—minimum score 86%.
2. National performance examinations (4 stations).

ACLS Recertification required at 2-year intervals, encouraged annually.

*BCLS Recertification is required at 1-year intervals.

Level of Certification:

Advanced Instructor

Level 10

Definition:

An instructor is any provider of ACLS who has attended and successfully completed an instructor course in ACLS and who has received a satisfactory monitor's report while serving as an instructor in a subsequent course.

Certification Contingent On:

1. Completion of an ACLS provider course with a Pass with Instructor Potential grade.
2. National cognitive exam—minimum score 86%.
3. National performance examinations of the following skills:
 - a. Basic cardiac life support at instructor level.*
 - b. Adjuncts for airway and mechanical breathing.
 - c. Endotracheal intubation of adult and infant and esophageal intubation of adult.
 - d. Placement of peripheral and central IV lifeline.
 - e. Recognition of ventricular fibrillation and defibrillation.
 - f. Recognition of dysrhythmias (dynamic and static).
 - g. Therapy for dysrhythmias.
 - h. Supervision and direction of arrest team in sequence of successful resuscitation.
4. Delivery of a satisfactory mini-lecture displaying content knowledge and teaching ability.
5. Demonstration of ability to teach the performance stations.
6. Monitoring of first provider course by a member of the ACLS Affiliate Faculty.

(Advanced instructor continued)

Responsibilities:

1. To train and certify providers in ACLS, in at least on provider course a year with other ACLS instructor or affiliate faculty present.
2. Assist the affiliate committee responsible to plan, implement and evaluate their Emergency Cardiac Care systems.
3. Become involved in the development and implementation of local and state emergency medical services system.
4. Serve their medical training institutions as directors or faculty.

Length of Course:

1 day beyond 2 day Provider Course

Recertification contingent on:

Yearly recertification of an instructor can be accomplished by:

1. Completing another instructor course in accordance with AHA guidelines.
2. Alternatively, if the instructor has taught two or more courses in the year immediately preceding, he or she may be recertified by one of the following:
 - a. Attending an instructor recertification course in accordance with AHA guidelines at least once every 2 years.
 - b. Teaching a provider or instructor level course while being monitored by an affiliate faculty member or by an instructor-trainer. The monitor must submit a report to the CPR or ECC Committee for approval.

Opportunities for recertification will be provided at:

1. Refresher/recertification courses.
2. ACLS instructor courses.
3. Instructor recertification session conducted by an ACLS affiliate faculty member.

** BCLS instructor certification is recommended but optional.
BCLS Recertification is required each year.

Level of Certification

Advanced Affiliate Faculty

Level IIDefinition:

Physicians, registered nurses or other appropriate paramedical personnel who as instructors of Advanced Cardiac Life Support have demonstrated by their commitment to the program a willingness to serve in this capacity and have been selected by the American Heart Association, Iowa Affiliate to so serve.

Certification contingent on:

Current certification at the ACLS Instructor level.

Participation in one formal instructor course or recertification program per year.

Attendance of at least one faculty session every two years (unless excused by Chairman).

Responsibilities:

1. To train instructors in ACLS.
2. Monitor ACLS instructors for the purpose of certification and recertification as they conduct provider courses in ACLS.
3. Assist instructors to train providers.
4. Assist the affiliate or chapter committee whose responsibility it is to plan, implement and evaluate their Emergency Cardiac Care Program.
5. Become involved in the development and implementation of local and state emergency medical service systems.
6. Guide and assist medical training institutions to integrate ACLS courses into the curricula.

Recertification contingent on:

Recertification is required every year.

Opportunities for recertification will be provided at one faculty recertification session per year, or in presence of 2 other affiliate faculty members at an ACLS instructor course.

Faculty membership terms are for 2 years from date of faculty appointment. Prior to completion of this two-year term, a member may reapply for continued membership on the faculty for an additional two years. Membership is contingent upon meeting recertification requirements.

SPECIAL NOTES

Courses:

A course director must be a physician who is certified ACLS Instructor. An Oral Surgeon may act as co-director. The Director must be at the course a majority of the time.

All ACLS instructor courses will be scheduled and conducted by the affiliate faculty.

Within a certification course a participant may repeat one failed station, excluding BCLS, and the Mega Code, and rewrite the written test once. Failure to pass either station or written test a second time or failure to pass BCLS or Mega Code, necessitates repeating complete certification testing.

Within a certification course, non-ACLS certified experts may present didactic material but certification in the performance stations must be done by a certified ACLS Instructor.

All ACLS provider certifications are valid for 2 years, Instructors - 1 year. It is the card holder's responsibility to complete recertification within 60 days of the expiration date of his current certification or certification will terminate and the individual must complete the entire course for the new certification.

Certification is recognition of successful completion of a course of instruction which includes passing cognitive and performance examinations related to the material presented in accordance with the established criteria of the American Heart Association. It is not intended to imply a form of licensure or to warrant future performance of the individuals certified, but only to indicate that the cognitive and performance capabilities meet the requirements for certification established for the course at the time testing is performed.

The guidelines are intended to reflect the standards for Advanced Cardiac Life Support as stated in the Manual for Instructors of Advanced Cardiac Life Support, American Heart Association 1981, including any and all updates.

ACLS

INTRODUCTION

UNIT # 1

UNIT

PREREQUISITES: none

REQUIRED

REFERENCES: Ch. 1, pp. 1-8, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture
AHA/ACLS Slide Series Unit #1 - Advanced Life Support

OBJECTIVES: 1. Define advanced life support.
2. Define sudden cardiac death.
3. List the factors that identify a high-risk patient.
4. Appreciate the importance of advanced life support in the provision of emergency cardiac care.

TOPIC

OUTLINE: 1. overview of ACLS course including:
a. historical perspectives
b. the magnitude of the problem of cardiovascular disease
c. the concept of sudden cardiac death
d. means of identifying the high-risk patient
e. current success and potential of CPR and ACLS
f. a systematic approach to emergency cardiac care
g. the objectives of the American Heart Association BLS and ACLS Support Programs.

EVALUATION: multiple choice questions on AHA/ACLS written examination

ACLS

MYOCARDIAL INFARCTION

UNIT # 2
page 1 of 2

UNIT PREREQUISITES: Unit 1

REQUIRED

REFERENCES: Ch. 2, pp. 11-22, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

- OBJECTIVES:
1. Define myocardial infarction (MI)
 2. Recognize the symptoms of and the responses to myocardial infarction
 3. Describe the five general management approaches to MI.
 4. Describe the management techniques for the following abnormal heart rates and arrhythmias:
 - a. premature ventricular complexes
 - b. ventricular rhythms
 - c. bradycardias
 - d. sinus tachycardias
 - e. supraventricular arrhythmias
 - f. atroventricular junctional rhythms
 - g. ventricular tachycardia
 - h. atrioventricular block
 - i. intraventricular block
 - j. ventricular fibrillation
 5. Describe normal hemodynamic patterns and the usual abnormal patterns following MI
 6. Define and describe the following cardiac conditions:
 - a. congestive heart failure
 - b. acute pulmonary edema
 - c. cardiogenic shock
 - d. right ventricular infarction
 - e. acute mitral regurgitation
 - f. ventricular septal rupture
 - g. massive pulmonary embolism
 - h. hypovolemia and septic shock
 - i. cardiac tamponade
 - j. aortic dissection
 7. List five special therapeutic considerations in the treatment of cardiovascular disease
 8. Describe the mortality of post-MI patients, both in-hospital and post-discharge, and measures to improve that mortality

TOPIC

- OUTLINE: 1. Myocardial Infarction:
- a. clinical presentation
 - b. general management approaches

ACLS

MYOCARDIAL INFARCTION
continuedUNIT # 2
page 2 of 2

TOPIC

- OUTLINE: 1. continued
 c. management of arrhythmias and heart rate
2. normal hemodynamic patterns
3. hemodynamic monitoring in patients with MI
 and other related cardiac conditions
4. cardiac conditions that must be
 differentially diagnosed from MI
5. special therapeutic considerations;
 a. pharmacologic
 b. invasive
6. late in-hospital and post-discharge mortality
 and management.

EVALUATION: multiple choice questions on AHA/ACLS written
examination

ACLS

ADJUNCTS FOR AIRWAY CONTROL,
VENTILATION, and SUPPLEMENTAL
OXYGEN

UNIT # 3

UNIT

PREREQUISITES: # 1

REQUIRED

REFERENCES: Ch. 3, pp. 27-38, Textbook of Advanced Cardiac
Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Slide Series Unit #2 - Adjuncts for
Airway and Breathing (Ventilation)

AHA/ACLS Teaching Station #1 - Adjuncts for
Airway and Mechanical Breathing

AHA/ACLS Teaching Station #2 - Esophageal and
Endotracheal Intubation

OBJECTIVES: as detailed in AHA/ACLS objectives and skills
for Teaching Stations #1: Adjuncts for Airway
and Mechanical Breathing and Teaching Station
and #2: Esophageal and Endotracheal Intubation

TOPIC

- OUTLINE:
1. airway control: head and jaw position,
 2. techniques of insertion and complications of;
 - a. oropharyngeal airways
 - b. nasopharyngeal airways
 - c. esophageal obturator-esophageal gastric
tube airways
 - d. endotracheal intubation
 - e. transtracheal catheter ventilation
 - f. cricothyrotomy
 - g. tracheostomy
 3. techniques, devices, and guidelines for the
administration of supplemental oxygen
 4. techniques and complications for methods of
oxygenation and ventilation including;
 - a. mouth-to-mask
 - b. bag-valve devices
 - c. manually triggered, oxygen-powered
breathing devices,
 5. devices for and techniques and complications
of tracheobronchial suctioning

EVALUATION: multiple choice questions on AHA/ACLS written
examination

AHA/ACLS testing station on airway management

AHA/ACLS testing station for Mega Code

ACLS

ADJUNCTS FOR
ARTIFICIAL CIRCULATION

UNIT # 4

UNIT

PREREQUISITES: # 1

REQUIRED

REFERENCES: Ch. 4, pp. 41-43, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture
AHA/ACLS Slide Series Unit #3 - Adjuncts for Artificial Circulation
BLS/CPR practice

- OBJECTIVES: 1. Describe the indications for and physiologic effects of the following:
- manual and automatic chest compressors
 - pneumatic antishock garments
 - direct cardiac massage
 - emergency cardiopulmonary bypass
 - intraaortic balloon counterpulsation.
2. Perform One-Rescuer CPR: Adult to AHA performance standards.
3. Demonstrate Two-Rescuer CPR: Adult using AHA performance standards.

TOPIC

OUTLINE:

- review of closed chest compression - BLS/CPR
- advantages and disadvantages of the cardiac press
- advantages and disadvantages of mechanical resuscitators
- pneumatic antishock garments
 - physiologic effects
 - clinical effects
 - complications
- indications for and efficacy of direct cardiac massage
- indications for emergency cardiopulmonary bypass
- intraaortic balloon counterpulsation
 - physiologic effects
 - indications for use

EVALUATION: multiple choice questions on AHA/ACLS written examination
AHA/ACLS testing station for Basic Life Support
AHA/ACLS testing station for Mega Code

ACLS

MONITORING AND DYSRHYTHMIA RECOGNITION

 UNIT # 5
page 1 of 2

UNIT

PREREQUISITES: # 1

REQUIRED

 REFERENCES: Ch. 5, pp. 45-87, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA Introduction to Cardiac Arrhythmia
 Interpretation Slide-Tape Series Unit #'s
 I. Functional Anatomy of the Heart
 II. Electrical and Chemical Phenomena of the Heart
 III. Analysis of the Electrocardiogram
 AHA/ACLS Slide Series Unit #4 - Monitoring and
 Dysrhythmia Recognition in Advanced Life Support
 AHA/ACLS Teaching Station #5 - Recognition of
 Dysrhythmias, Static and Dynamic

- OBJECTIVES:
1. Describe the functional anatomy and electrophysiological activities of the heart.
 2. Describe the components necessary to identify arrhythmias.
 3. Define, describe, and be able to recognize the following rhythms and arrhythmias:
 - a. normal sinus rhythm
 - b. sinus tachycardia
 - c. sinus bradycardia
 - d. premature atrial contractions
 - e. atrial tachycardia
 - f. atrial flutter
 - g. atrial fibrillation
 - h. premature junctional complexes
 - i. junctional escape complexes and rhythms
 - j. premature ventricular complex
 - k. ventricular tachycardia including torsade de pointes
 - l. ventricular fibrillation
 - m. ventricular asystole (cardiac standstill) n. atrioventricular blocks including:
 - first-degree AV block
 - type 1 second-degree AV block (Wenckebach)
 - type 2 second-degree AV block
 - third-degree AV block
 - o. supraventricular and ventricular complexes and rhythms
 4. Describe presentation and etiologies of and therapies for non-life threatening arrhythmias

ACLS

MONITORING AND
DYSRHYTHMIA RECOGNITIONUNIT # 5
page 2 of 2

TOPIC

- OUTLINE:
1. electrical activity of the heart
 - a. working myocardial cells
 - b. electrical system cells
 - c. basic electrophysiology
 - d. automaticity
 - e. reentry
 - f. cardiac impulse conduction
 - g. three causes of cardiac arrhythmias
 2. relationship of the electrocardiogram to the anatomy of the cardiac conduction system
 3. monitoring system requirements
 4. method for arrhythmia identification
 - a. determination of rate
 - b. pattern of regularity
 - c. width of ventricular complex
 - d. recognizing and defining atrial activity
 - e. relationship of P's to QRS's
 - f. sites of origin for impulse
 - i. sinus node
 - ii. atrium
 - iii. AV junction
 - iv. ventricle
 5. identification of arrhythmias based on:
 - a. rate
 - b. rhythm and pattern
 - c. P waves
 - d. PR interval
 - e. QRS interval, ST segment, T wave
 6. etiology, pathology, and treatment of the following non-life threatening arrhythmias:
 - a. premature atrial complexes
 - b. atrial flutter
 - c. atrial fibrillation
 - d. premature junctional complexes
 - e. junctional tachycardia
 - f. first-degree heart block

EVALUATION: multiple choice questions on AHA/ACLS written examination

AHA/ACLS testing station for Rhythm and Drugs

AHA/ACLS testing station for Mega Code

ACLS

DEFIBRILLATION
AND CARDIOVERSIONUNIT # 6
page 1 of 2

UNIT

PREREQUISITES: #'s 1, 5

REQUIRED

REFERENCES: Ch. 6, pp. 89-96, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Slide Series Unit #5 - Defibrillation
and Synchronized Cardioversion
AHA/ACLS Teaching Station #4 - Defibrillation
and Cardioversion

- OBJECTIVES:
1. Describe the components of a DC defibrillator.
 2. Define the concepts of energy, current, and voltage as they pertain to defibrillation and cardioversion.
 3. Describe the physiologic effects of defibrillation.
 4. Define the energy requirements for adult and pediatric defibrillation.
 5. Describe and be able to perform the procedure asynchronous defibrillation and urgent synchronized cardioversion.
 6. Describe the special considerations in resuscitating a patient with an automatic implantable cardioverter defibrillator or a permanent pacemaker.
 7. Describe three approaches to external cardiac pacing and the indications for each approach.
 8. Describe the indications and procedure for a precordial thump.

TOPIC

- OUTLINE:
1. design and function of a direct current defibrillator
 2. components of energy (joules) generation
 - a. power (watts)
 - b. potential (volts)
 - c. current (amperes)
 - d. resistance (ohms)
 3. factors in defibrillation efficiency
 - a. electrode size
 - b. chest wall interface
 - c. previous defibrillation shocks
 - d. electrode-chest wall contact pressure
 - e. ventilatory pattern

ACLS

DEFIBRILLATION
AND CARDIOVERSIONUNIT # 6
page 2 of 2

TOPIC

OUTLINE: 3. continued-

- f. electrode placement
- 4. energy requirements for adult defibrillation
- 5. indications and energy requirements for pediatric defibrillation
- 6. electrocardiographic recognition of ventricular defibrillation
- 7. seven step procedure for defibrillation
- 8. urgent synchronized cardioversion
 - a. indications
 - b. technique
- 9. automatic implantable cardioverter defibrillators
 - a. principles
 - b. precautions in resuscitation
- 10. precautions in defibrillation and cardioversion of patients with permanent pacemakers
- 11. precordial thump
 - a. indications and precautions
 - b. procedure

EVALUATION: multiple choice questions on AHA/ACLS written examination

AHA/ACLS testing station for Rhythm and Drugs

AHA/ACLS testing station for Mega Code

ACLS

INTRAVENOUS TECHNIQUES

UNIT # 7
page 1 of 2

UNIT

PREREQUISITES: # 1

REQUIRED

REFERENCES: Ch. 11, pp. 141-152,

Textbook of Advanced CardiacLife Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Slide Series Unit #6 - Intravenous
TechniquesAHA/ACLS Teaching Station #3 - Intravenous and
Invasive Techniques

- OBJECTIVES:
1. Name three indications for intravenous (IV) cannulation.
 2. Name three types of intravenous cannulas.
 3. Describe indications and techniques for each of the three IV cannulas.
 4. Describe principles and complications common to all IV techniques.
 5. Describe the anatomy and insertion techniques for peripheral veins.
 6. Describe advantages and disadvantages in the use of peripheral veins for IV cannulation.
 7. Be able to perform IV cannulation on the peripheral veins of the upper extremities.
 8. Describe the anatomy, insertion techniques, advantages, disadvantages, and specific complications in the IV cannulation of the following:
 - a. femoral vein
 - b. internal jugular vein
 - c. subclavian vein

TOPIC

- OUTLINE:
1. indications for IV cannulation:
 - a. to administer drugs and fluids
 - b. to obtain specimens of venous blood for laboratory determination
 - c. to insert catheters into the central circulation, including the right heart and pulmonary artery for physiologic monitoring and electrical pacing
 2. IV cannula types:
 - a. hollow needles
 - b. indwelling plastic catheters inserted over a hollow needle
 - c. indwelling plastic catheters inserted through a hollow needle or over a

ACLS

INTRAVENOUS TECHNIQUES

UNIT # 7
page 2 of 2

TOPIC

- OUTLINE: 2. c. continued -
 guidewire previously introduced through
 a needle
 d. indications, diameters, length
 measurements, and IV connections
3. common principles for IV cannulation
 a. site selection
 b. asepsis
 c. skin anesthesia
 d. 'to keep open' fluids
4. common complications to IV cannulation
 a. local
 b. systemic
5. peripheral veins - anatomy techniques,
 advantages, and disadvantages for the
 following:
 a. veins of the upper extremities
 b. long saphenous vein in the lower
 extremity c. external jugular vein
6. femoral vein - anatomy, technique,
 advantages, disadvantages, and specific
 complications
7. internal jugular vein - anatomy, indications,
 general principles of technique, specific
 techniques, advantages and disadvantages of
 the following sites:
 a. posterior
 b. central
 c. anterior
8. subclavian vein - anatomy, indications,
 general principles of technique, specific
 techniques, for the following sites:
 a. infraclavicular
 b. subclavian
 c. by way of the external jugular vein
9. j-wire - advantages, disadvantages, specific
 local and systemic complications

EVALUATION: multiple choice questions on AHA/ACLS written
examination
demonstration of proper technique for
cannulation of a peripheral vein of the upper
extremity.

ACLS

CARDIOVASCULAR PHARMACOLOGY

UNIT # 8

page 1 of 2

UNIT

PREREQUISITES: #'s 1, 5, 6

REQUIRED

REFERENCES: Ch.s 7, 8, pp. 97-110, 115-125, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Slide Series Unit #'s

7. Essential Drugs in Emergency Cardiac Care

8. Useful Drugs

AHA/ACLS Teaching Station #6 - Recognition of Dysrhythmias and Therapeutic Modalities

OBJECTIVES: 1. Describe - mechanisms of actions
- indications
- dosage and administration
and - precautions for the following drugs:

- a. oxygen
- b. epinephrine
- c. atropine
- d. lidocaine
- e. procainimide
- f. bretylium
- g. verapamil
- h. sodium bicarbonate (NaHCO_3)
- i. morphine
- j. calcium chloride
- k. norepinephrine
- l. dopamine
- m. dobutamine
- n. isoproterenol
- o. amrinone
- p. digitalis
- q. sodium nitroprusside
- r. nitroglycerin
- s. propranolol
- t. metoprolol
- u. furosemide

TOPIC

- OUTLINE: 1. seven pharmacotherapeutic objectives of ACLS
2. mechanisms of actions,
cardiac indications,
dosage,
modes of administration,
relative importance in ACLS treatment
algorithms,

ACLS

CARDIOVASCULAR PHARMACOLOGY

UNIT # 8

page 2 of 2

TOPIC

- OUTLINE: 2. continued -
precautions,
contraindications and
incompatibilities of the drugs listed in
above objective
3. antiarrhythmic drug classification
4. cardiovascular adrenergic responses
- a. vasoconstriction
 - b. vasodilation
 - c. inotropic
 - d. chronotropic
 - e. bronchodilation
 - f. smooth muscle relaxation
 - g. fat metabolism
 - h. glycogenolysis
 - i. hypokalemia
- for the following receptors
- a. alpha-1
 - b. alpha-2
 - c. beta-1
 - d. beta-2
 - e. dopaminergic

EVALUATION: multiple choice questions on AHA/ACLS written
examination
AHA/ACLS testing station for Rhythm and Drugs
AHA/ACLS testing station for Mega Code

ACLS

MEGA CODE/ACLS ALGORITHMS

UNIT # 9
page 1 of 2

UNIT

PREREQUISITES: #'s 1, 2, 3, 4, 5, 6, 7

REQUIRED

REFERENCES: Part III, Adult Advanced Cardiac Life Support, pp. 2945-2950, 'Standards And Guidelines For Cardiopulmonary Resuscitation And Emergency Cardiac Care', American Heart Association, reprinted from The Journal of the American Medical Association, June 6, 1986, Volume 255, Number 21

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Teaching Station #6 - Recognition of Dysrhythmias and Therapeutic Modalities
AHA/ACLS Teaching Station #7 - Mega Code

OBJECTIVES: 1. Describe the indications for and components of the following ACLS algorithms:

- a. ventricular fibrillation*
- b. sustained ventricular tachycardia
- c. asystole (cardiac standstill)
- d. electromechanical dissociation
- e. paroxysmal supraventricular tachycardia
- f. bradycardia
- g. ventricular ectopy: acute suppressive therapy

*with emphasis on ventricular fibrillation.

2. perform to specified criteria the components of the Mega Code For Testing The Advanced Cardiac Life Support Team Leader

TOPIC

OUTLINE: 1. basic life support,
pharmacologic therapy support,
electrical therapy support,
and sequencing for the following:

- a. ventricular fibrillation with witnessed and unwitnessed arrest
- b. sustained ventricular tachycardia - pulseless, stable and unstable
- c. asystole (cardiac standstill) with differentiation from ventricular fibrillation
- d. electromechanical dissociation - definition and its associated conditions
- e. paroxysmal supraventricular tachycardia - unstable and stable
- f. bradycardia - differentiating for sinus

ACLS

MEGA CODE/ACLS ALGORITHMS

UNIT # 9

page 2 of 2

TOPIC

- OUTLINE: 1. f. continued -
or junctional, type 1 second-degree AV
block, type 2 second-degree AV block and
third-degree AV block
g. ventricular ectopy: acute suppressive
therapy - etiologies and differential
2. Mega Code - demonstration for ventricular
fibrillation

EVALUATION: multiple choice questions on AHA/ACLS written
examination
AHA/ACLS testing station for Mega Code

ACLS

PEDIATRIC RESUSCITATION

UNIT # 10
page 1 of 3

UNIT

PREREQUISITES: #'s 1, 3, 4

REQUIRED

REFERENCES: Ch. 18, pp. 257-268,

Textbook of Advanced CardiacLife Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

- review BLS guidelines for One-Rescuer CPR -
- Child and Infant, Obstructed Airway-Conscious
- and Unconscious - Child and Infant
- AHA/ACLS Testing Station #2 - Skills Section D -
- Infant Intubation

- OBJECTIVES:
1. Define respiratory failure and shock in the context of pediatric resuscitation.
 2. Describe the components in the assessment of:
 - a. respiratory performance
 - b. cardiovascular performance.
 3. Describe a method for rapid cardiopulmonary assessment.
 4. Describe management methods for the following:
 - a. airway and breathing support
 - b. circulation support
 - c. pharmacologic support.
 5. Describe the presentation of and indications for treatment of the following arrhythmias in pediatric age patients:
 - a. supraventricular tachycardia
 - b. ventricular tachycardia
 - c. bradycardias
 - d. ventricular fibrillation
 - e. electromechanical dissociation (EMD).
 6. Review defibrillation indications and techniques for pediatric patients.
 7. Describe the indications and dosage for the pediatric usages of lidocaine and bretylium for the management of ventricular arrhythmias.

TOPIC

- OUTLINE:
1. respiratory failure - definition
 2. shock - definition
 3. respiratory performance assessment
 - a. signs of impending failure
 - b. normal and abnormal respirations
 - c. respiratory rate
 - d. respiratory mechanics

ACLS

PEDIATRIC RESUSCITATION

UNIT # 10
page 2 of 3

TOPIC

OUTLINE: 3. continued -

- e. cyanosis
- 4. cardiovascular performance assessment
 - a. signs of shock
 - b. heart rate
 - c. blood pressure
 - d. peripheral circulation
 - e. end-organ perfusion
- 5. rapid cardiopulmonary assessment
 - a. respiratory - breathing rate, air entry, mechanics, color
 - b. cardiovascular - heart rate, blood pressure, peripheral pulses, skin perfusion, CNS perfusion
 - c. conditions requiring rapid assessment
- 6. airway/breathing support
 - a. oxygen delivery systems
 - b. airways
 - c. ventilation systems
 - d. bag-valve devices
 - e. endotracheal airway
- 7. circulation support
 - a. vascular access - venous cannulation and access priorities, interosseous cannulation, arterial cannulation
 - b. volume expansion
- 8. pharmacologic support
 - a. general guidelines
 - b. oxygen
 - c. epinephrine - bolus and infusion
 - d. sodium bicarbonate
 - e. atropine
 - f. glucose
 - g. calcium chloride
 - h. isoproterenol
 - i. dopamine
 - j. dobutamine
- 9. disturbances in cardiac rhythms
 - a. conditions requiring emergency treatment
 - b. pediatric implications of supraventricular tachycardia, ventricular tachycardia, bradycardias, ventricular fibrillation, and electromechanical dissociation
- 10. pediatric procedure, modifications, and indications for defibrillation
- 11. pediatric indications for the use of the following drugs for the management of ventricular arrhythmias:
 - a. lidocaine

ACLS

PEDIATRIC RESUSCITATION

UNIT # 10
page 3 of 3

TOPIC

OUTLINE: 11. continued -
b. bretylium tosylateEVALUATION: multiple choice questions on AHA/ACLS written
examination
AHA/ACLS testing station for airway management

ACLS

ACID-BASE BALANCE

UNIT # 11
page 1 of 2

UNIT PREREQUISITES: #'s 1, 2

REQUIRED

REFERENCES: Ch. 9, pp. 129-133, Textbook of Advanced Cardiac Life Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

AHA/ACLS Slide Series Unit #9 - Acid-Base Balance

- OBJECTIVES:
1. Define acid and base as they relate to body pH.
 2. Describe the respiratory and metabolic constituents that alter pH and how it is altered.
 3. Describe the body's buffer systems.
 4. Describe a method for clinical blood gas analysis.
 5. Describe the acid-base changes that occur during CPR.
 6. Describe the indications for the use of pharmacological buffers during CPR.

TOPIC

- OUTLINE:
1. acid, base, hydrogen ion concentration and their effect on body pH.
 2. production, accumulation, and elimination of carbon dioxide and metabolic acids
 3. base accumulation
 4. buffer systems:
 - a. mechanisms that raise and lower the hydrogen ion concentration
 - b. mechanisms that respond to hydrogen ion concentration
 5. components measured by blood gas analysis
 6. definitions of:
 - a. respiratory acidosis
 - b. metabolic acidosis
 - c. mixed acidosis
 - d. respiratory alkalosis
 - e. metabolic alkalosis
 - f. mixed alkalosis
 7. acid-base changes in CPR
 - a. respiratory acidosis, hypercarbia
 - b. metabolic acidosis, anaerobic metabolism
 - c. venous paradox
 - d. methods to rectify changes
 8. pharmacologic actions of, indications and contraindications for the use of the following buffers:

ACLS

ACID-BASE BALANCE

UNIT # 11
page 2 of 2

TOPIC

OUTLINE: #8 continued

- a. sodium bicarbonate
- b. THAM
- c. DCA

EVALUATION: multiple choice questions on AHA/ACLS written
examination

ACLS

MEDICOLEGAL ASPECTS

UNIT # 12

UNIT

PREREQUISITES: # 1

REQUIRED

REFERENCES: Ch. 19, pp. 271-277,

Textbook of Advanced CardiacLife Support, American Heart Association

LEARNING

ACTIVITIES: attend lecture

- OBJECTIVES:
1. Describe five general concepts of medical-legal liability.
 2. Describe the decision-making processes for whether or not to initiate CPR.
 3. Describe the decision-making processes for terminating CPR.
 4. Define the concept, indications, and legality of Do Not Resuscitate orders.
 5. Describe the decision-making processes for terminating life support systems.

TOPIC

- OUTLINE:
1. concepts of legal liability/malpractice
 - a. physician-patient relationships
 - b. duty of care
 - c. negligence and standard of care
 - d. injury and causation
 - e. great danger and due diligence
 - f. brain death
 2. initiating CPR
 - a. concept of brain recoverability
 - b. current standard for initiation
 - c. concept and components of Dead On Arrival (DOA)
 - d. manifestations of brain damage - pupil reactivity, electroencephalographic evidence, 'boxcars'
 3. terminating CPR
 - a. criteria for discontinuance
 - b. cardiovascular unresponsiveness
 4. Do Not Resuscitate
 - a. definitions
 - b. indications
 - c. legal status
 - d. case law
 5. discontinuing life support - uniform definition of brain death

EVALUATION: multiple choice questions on AHA/ACLS written examination